WHAT IS CLAIMED IS:

1. A method of generating a cell culture comprising dopaminergic neuron cells, said method comprising:

   a. proliferating precursor cells, said step of proliferating comprising:

      i. incubating a suspension of said precursor cells in a proliferating medium which includes basic fibroblast growth factor (bFGF) to form proliferated precursor cells; and

   b. differentiating said precursor cells, said step of differentiating comprising:

      i. incubating said precursor cells in an incubation vessel which contains differentiation medium in a manner effective to form a reaggregation of differentiated cells that is not adhered to any surface of the incubation vessel wherein the differentiation medium includes ascorbic acid.

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2. The method of claim 1, wherein said step of differentiating comprises incubating the precursor cells in a roller tube.

3. The method of claim 1, wherein said step of proliferating comprises plating said suspension of precursor cells onto a proliferating medium and incubating for 5 to 10 days.

4. The method of claim 3, wherein said suspension comprises 50 x 10^3 cells/ml to 500 x 10^3 cells/ml precursor cells.

5. The method of claim 1, wherein said step of differentiating comprises incubating said precursor cells in differentiation medium for 5 to 10 days.

6. The method of claim 1, wherein said cell culture comprises between 1% and 5% glial cells.

7. The method of claim 1, wherein said precursor cells comprise mesencephalic cells.

8. The method of claim 1, wherein said cell culture further comprises cholinergic neuronal cells.

9. The method of claim 8, wherein said precursor cells comprise basal forebrain cells or spinal cord cells.

10. The method of claim 1, wherein said cell culture further comprises serotonergic cells.

11. The method of claim 10, wherein said precursor cells comprise nucleus raphe cells.

12. Use of cells cultured according to the method of claim 1 to treat a patient with a neurological disorder.

13. The method of claim 12, wherein said neurological disorder is Parkinson's disease.

14. A method of introducing a gene product into a brain of a patient, comprising:
   A. transforming neuronal precursor cells;
   B. culturing said neuronal precursor cells according to claim 1 to form differentiated transformed neuronal cells; and
   C. administering differentiated transformed neuronal cells to a patient in need thereof.

15. The method of claim 14, wherein said transformed cell produces a gene product selected from the group consisting of tyrosine hydroxylase, nerve growth factor (NGF), brain derived neurotrophic factor (BDGF), basic fibroblast growth factor (bFGF) and glial derived growth factor (GDGF).

16. Use of cells cultured according to the method of claim 1 in an assay.

17. A cell culture comprising about 80% to about 95% of a total cell population in the culture comprise differentiated neuronal cells and less than 5% of the total cell population comprises glial cells.

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18. The cell culture of claim 17 wherein the differentiated neuronal cells comprise dopamiuergic cells.

19. The cell culture of claim 18, wherein dopaminergic neurons comprise 18.4% +/- 5.1% of the total cell population.

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